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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Attorney Docket No. 11670.00006)



Applicant: Lifson, Alexander                      Group Art Unit: TBA  
Serial No.: TBA    Examiner: TBA  
Filed: On Even Date Herewith  
For: PULSED FLOW FOR CAPACITY CONTROL  
Original Filing Date: December 8, 1997  
Original Patent No: 6,047,556  
Granted: April 11, 2000

\*\*\*\*\*

Assistant Commissioner for Patents  
Box REISSUE  
Washington, DC 20231

TRANSMITTAL LETTER FOR REISSUE APPLICATION OF  
U.S. PATENT No. 6,047,556

Sir:

Enclosed for filing please find the following reissue application papers for the above referenced patent:

- (i) Return Receipt Postcard;
- (ii) Reissue Application Fee Transmittal Form;
- (iii) Reissue Application Declaration by the Inventor;
- (iv) Reissue Application by the Inventor, Offer to Surrender Patent;
- (v) Reissue Application by the Assignee, Offer to Surrender Patent;
- (vi) Statement Under 37 C.F.R. 3.73(b);
- (vii) Copy of Specification, Figure and Claims;
- (viii) Preliminary Amendment; and
- (ix) Request for Interference with U.S. Patent No. 6,206,652.

PATENT

The Commissioner is hereby authorized to charge all fees or credit overpayments to Deposit Account No. 19-0733.

Respectfully submitted,  
Lifson, A.

Date: 30 July 2001

By

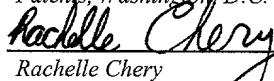


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**CERTIFICATE OF MAILING**

*I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington D.C. 20231 on: July 30, 2001.*

  
Rachelle Chery

07/30/01  
Date

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REISSUE APPLICATION FEE TRANSMITTAL FORM						Docket Number (Optional)		
						11670.00006		
Claims as Filed - Part 1								
Claims in Patent	For	Number Filed in Reissue Application	(3) Number Extra	Small Entity		Other than a Small Entity		
				Rate	Fee	Rate	Fee	
(A) 3	Total Claims (37 CFR 1.16(j))	(B) 38	**** 18 =	x \$	=	or	x \$ 18 = 324	
(C) 2	Independent Claims (37 CFR 1.16(i))	(D) 7	* 5 =	x \$	=		x \$ 80 = 400	
Basic Fee (37 CFR 1.16(h))				\$			\$ 710	
Total Filing Fee				\$		OR	\$ 1434	
Claims as Amended - Part 2								
	(1) Claims Remaining After Amendment		(2) Highest Number Previously Paid For	(3) Extra Claims Present	Small Entity		Other than a Small Entity	
					Rate	Fee	Rate	Fee
Total Claims (37 CFR 1.16(j))	***	MINUS	**	=	x \$	=	or	x \$ =
Independent Claims (37 CFR 1.16(i))	***	MINUS	*****	=	x \$	=		x \$ =
Total Additional Fee				\$		OR	\$	
<p>* If the entry in (D) is less than the entry in (C), Write "0" in column 3.</p> <p>** If the "Highest Number of Total Claims Previously Paid For" is less than 20, Write "20" in this space.</p> <p>*** After any cancellation of claims</p> <p>**** If "A" is greater than 20, use (B - A); if "A" is 20 or less, use (B - 20).</p> <p>***** "Highest Number of Independent Claims Previously Paid For" or Number of Independent Claims in Patent (C).</p>								
<p><input checked="" type="checkbox"/> Please charge Deposit Account No. <u>19-0733</u> in the amount of <u>\$ 1,434.00</u>. A duplicate copy of this sheet is enclosed.</p> <p><input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees under 37 CFR 1.16 or 1.17 which may be required, or credit any overpayment to Deposit Account No. <u>19-0733</u>. A duplicate copy of this sheet is enclosed.</p> <p><input type="checkbox"/> A check in the amount of \$ _____ to cover the filing / additional fee is enclosed.</p>								
<p><u>30 July 2001</u> Date</p>		<p> Signature of Applicant, Attorney or Agent of Record</p> <p>Peter D. McDermott Typed or printed name</p>						

**STATEMENT UNDER 37 CFR 3.73(b)**

Applicant/Patent Owner: Carrier Corporation

Application No./Patent No.: 6,047,556 Filed/Issue Date: April 11, 2000

Entitled: Pulsed Flow for Capacity Control

Carrier Corporation, a \_\_\_\_\_ corporation,  
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of an undivided part interest

in the patent application/patent identified above by virtue of either:

- A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the Patent and Trademark Office at Reel 9094, Frame 0764, or for which a copy thereof is attached.

OR

- B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: \_\_\_\_\_ To: \_\_\_\_\_  
The document was recorded in the Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.
2. From: \_\_\_\_\_ To: \_\_\_\_\_  
The document was recorded in the Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.
3. From: \_\_\_\_\_ To: \_\_\_\_\_  
The document was recorded in the Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

- ☐ Copies of assignments or other documents in the chain of title are attached.

**[NOTE:** A separate copy (i.e., the original assignment document or a true copy of the original document) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the PTO. See MPEP 302-302.8]

The undersigned (whose title is supplied below) is empowered to sign this statement on behalf of the assignee.

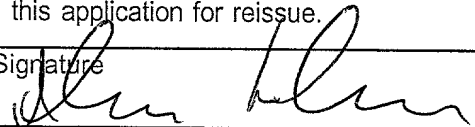
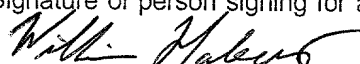
July 25, 2001  
Date

William Habelt  
Signature

William Habelt  
Typed or printed name

Intellectual Property Counsel & Asst. Secretary  
Title

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

REISSUE APPLICATION BY THE INVENTOR, OFFER TO SURRENDER PATENT		Docket Number (Optional) 11670.00006
This is part of the application for a reissue patent based on the original patent identified below.		
Name of Patentee(s) Alexander Lifson		
Patent Number 6,047,556	Date Patent Issued April 11, 2000	
Title of invention Pulsed Flow for Capacity Control		
<p>I am the inventor of the original patent.</p> <p>I offer to surrender the original patent.</p> <p>1. <input checked="" type="checkbox"/> Filed herein is a certificate under 37 CFR 3.73(b).</p> <p>2. <input type="checkbox"/> Ownership of the patent is in the inventor(s), and no assignment of the patent has been made.</p> <p>One of boxes 1 or 2 above must be checked.</p> <p>The written consent of all assignees owning an undivided interest in the original patent is included in this application for reissue.</p>		
Signature 		Date July 25/01
Typed or printed name Alexander Lifson		
The assignee owning an undivided interest in said original patent is <u>Carrier Corporation</u> and the assignee consents to the accompanying application for reissue.		
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application, any patent issued thereon, or any patent to which this declaration is directed.		
Name of assignee Carrier Corporation		
Signature of person signing for assignee 		Date July 25, 2001
Typed or printed name and title of person signing for assignee William Habelt Intellectual Property Counsel & Asst. Secretary		

Burden Hour Statement: This form is estimated to take 0.1 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

<b>REISSUE APPLICATION BY THE ASSIGNEE, OFFER TO SURRENDER PATENT</b>		Docket Number (Optional) 11670.00006
<p>This is part of the application for a reissue patent based on the original patent identified below.</p>		
Name of Patentee(s): Alexander Lifson		
Patent Number 6,047,556	Date Patent Issued April 11, 2000	
Title of Invention Pulsed Flow for Capacity Control		
<p><u>Carrier Corporation</u> is the assignee of the entire interest in the original patent.</p> <p>I offer to surrender the original patent.</p> <p><input checked="" type="checkbox"/> A certificate under 37 CFR 3.73(b) is attached.</p> <p>I am authorized to act on behalf of the assignee.</p>		
<p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application, any patent issued thereon, or any patent to which this declaration is directed.</p>		
Name of assignee Carrier Corporation		
Signature of person signing for assignee <i>William Habelt</i>	Date <i>July 25, 2001</i>	
Typed or printed name and title of person signing for assignee William Habelt Intellectual Property Counsel & Secretary		

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**(Attorney Docket No. 11670.00006)**

Applicant: Lifson, Alexander                      Group Art Unit: TBA  
Serial No.: TBA    Examiner: TBA  
Filed: On Even Date Herewith  
For: PULSED FLOW FOR CAPACITY CONTROL  
Original Filing Date: December 8, 1997  
Original Patent No: 6,047,556  
Granted: April 11, 2000

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**REQUEST FOR INTERFERENCE UNDER 37 C.F.R. § 1.607**

Dear Sir:

This request for interference under 37 C.F.R. § 1.607 *et seq.* is filed together with a request for reissue application for U.S. Patent No. 6,047,556 (the '556 Patent), a copy of U.S. Patent No. 6,047,556, a Preliminary Amendment for reissue application of U.S. Patent No. 6,047,556, a reissue application declaration by the inventor, an offer to surrender the patent, and a statement under 37 CFR § 3.73(b). Applicant respectfully requests that the Examiner declare an interference between the instant reissue application and U.S. Patent No. 6,206,652 (the '652 Patent) granted to Caillat, as further discussed below.

**I. Applicant Requests Declaration of an Interference Between the Instant Reissue Application and U.S. Patent No. 6,206,652**

Applicant respectfully requests that an interference be declared between the instant reissue application, having an effective filing date of December 8, 1997, and U.S. Patent No.

6,206,652 granted to Caillat, issued on March 27, 2001 and having an effective filing date of August 25, 1998.

## **II. Proposed Counts**

Applicant respectfully proposes the following counts.

### **Count I**

An air conditioning or refrigeration system comprising a compressor having a refrigeration fluid suction port and a refrigeration fluid discharge port, and a valve in fluid communication with the compressor, the valve being operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity.

### **Count II**

A method of modulating the capacity of a compressor comprising cycling a valve, in fluid communication with the compressor, using a cycle time shorter than the response time of the system to modulate compressor capacity.

## **III. Claims in the Instant Reissue Application and in U.S. Patent No. 6,206,652 that Correspond to Proposed Counts I and II**

Claims 1-28 of U.S. Patent No. 6,206,652 and Claims 4-15, 17-27 and 29-32 of the instant reissue application correspond to proposed Count I (please see discussion of claim language in Section IV below).

Claim 29 of U.S. Patent No. 6,206,652 and Claims 33-38 of the instant reissue application correspond to proposed Count II (please see discussion of claim language in section IV below).



#### **IV. Claim Language Used in the Instant Reissue Application and U.S. Patent No. 6,206,652 have the Exact Same Meanings**

##### **(a) Claim Language**

Applicant submits that although the claim language used in the instant reissue application and in U.S. Patent No. 6,206,652 are literally different, the meaning of the claim language in the instant reissue application and in U.S. Patent No. 6,206,652 is exactly the same.

In claims 1-16 and 17-28 of United States Patent No. 6,206,652, Caillat recites “cycling a valve such that its cycle time is substantially smaller than the time constant of the load on said compressor” (claims 1-16) and “actuating said valve to an open position for first predetermined time periods and to a closed position for second predetermined time periods, the ratio of said first predetermined time periods to the sum of said first and second predetermined time periods being less than a given load time constant and determining the percentage modulation of the capacity of said compressor (claims 17-28).” Similarly, claim 29 of United States Patent No. 6,206,652 recites “pulsing a valve between open and closed positions for said first and second time periods respectively to thereby modulate the capacity of said compressor in response to said system operating parameter.” Applicant submits that the claim language used by Caillat has the exact same meaning as the claim language used by applicant.

In claims 4-13, 17-23 and 29-32 of the instant reissue application, applicant refers to a valve that is “operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity.” Applicant submits that this claim language has the exact same meaning as the claim language used by Caillat in claims 1-29 of U.S. Patent No. 6,206,652 (see definitions below in section IV.(b)). In claims 14-15, 24-27 and 33-38 of the instant reissue application, applicant refers to a valve that is operative “to cycle between a fully open position and a fully closed position to modulate compressor capacity.” Applicant submits that this claim

language has the exact same meaning as the claim language used by Caillat in claims 1-29 of U.S. Patent No. 6,206,652 (please see definitions below in section IV.(b)).

**(b) Definitions**

Response Time: As used in *Mark's Standard Handbook for Mechanical Engineers*, Eighth Edition, 1978, pp. 16-25, response time is the time required for the controlled variable to reach a specified value after the application of a step input or disturbance. As used in the *McGraw-Hill Dictionary of Scientific and Technical Terms*, Third Edition, 1984, response time is the time required for the output of a control system or element to reach a specified fraction of its new value after application of a step input or disturbance.

Time Constant: As used in the *McGraw-Hill Dictionary of Scientific and Technical Terms*, time constant is (a) the time required for a physical quantity to rise from zero to  $1-(1/e)$  (63.2%) of its final steady state value when it varies with time as  $e^{-kt}$  (where  $t$  is time and  $k$  is a constant); (b) the time required for a physical quantity to fall to  $1/e$  (that is, 36.8%) of its initial value when it varies with time as  $e^{-kt}$ ; (c) generally, the time required for an instrument to indicate a given percentage of the final reading resulting from an input signal.”

Based on these definitions, applicant submits that the terms time constant and response time have the same meaning. That is, the time required for a controlled variable to reach a specified value (definition of response time) is equivalent to the time required for a physical quantity to reach a specified value (definition of time constant). Thus the terms are interchangeable. Accordingly, Caillat's recitation of cycling a valve such that its cycle time is substantially smaller than the time constant of the load on said compressor is equivalent to applicant's recitation of a valve operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. Additionally, Caillat's recitation of actuating said valve to an open position for first predetermined time periods and to a closed

position for second predetermined time periods, the ratio of said first predetermined time periods to the sum of said first and second predetermined time periods being less than a given load time constant and determining the percentage modulation of the capacity of said compressor is equivalent to applicant's recitation of a valve operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. Furthermore, Caillat's recitation of pulsing a valve between open and closed positions for said first and second time periods respectively to thereby modulate the capacity of said compressor in response to said system operating parameter is the same as applicant's recitation of cycling a valve between a fully open position and a fully closed position to modulate compressor capacity. Though not explicitly recited in applicant's claims, applicant submits that the valve must be open and closed for time periods to modulate compressor capacity.

Therefore, although the claim language of the instant application and claims 1-29 of U.S. Patent No. 6,206,652 differs literally, the meaning of the claim language is exactly the same.

#### **V. Supporting Language for Claims 4-15, 17-27, and 29-38 of the Instant Reissue Application**

The terms of claims 4-15, 17-27 and 29-32 corresponding to proposed Count I are supported in Applicant's specification as shown in Table I in attached Exhibit A.

The terms of claims 33-38 corresponding to proposed Count II are supported in Applicant's specification as shown in Table II in attached Exhibit B.

The support shown in Tables I and II is, in general, merely exemplary and/or illustrative of the full support provided by the specification, figure, abstract and claims.

#### **VI. The Requirements of 35 U.S.C. § 135(b) are Satisfied**

Because the instant reissue application was filed within one year of issuance of United States Patent No. 6,206,652, which issued on March 27, 2001, applicant submits that the requirements of 35 U.S.C. § 135(b) have been met.

## **VII. Applicant is *Prima Facie* Entitled to Judgment on Priority**

Because applicant's effective filing date of December 8, 1997 is more than eight months prior to the effective filing date of United States Patent No. 6,206,652, which is August 25, 1998, applicant is *prima facie* entitled to judgment on priority with respect to the effective filing date of the instant reissue application.

## **VIII. Claims 1-3, 16, and 28 of the Instant Reissue Application Are Patentable Over the Subject Matter of the Proposed Counts**

**Claims 1-3.** Claims 1-3 of the instant reissue application are patentable over the subject matter of proposed counts I and II. Claims 1-2 of the instant reissue application are directed to a system having a compressor and comprising a solenoid valve in a suction line, a means for pulsing the solenoid valve in the suction line, a fluid path from a condenser and an expansion device to the compressor, a bypass line connected to the fluid path and the suction line, a solenoid valve in the bypass line, and a means for rapidly pulsing the solenoid valve in the bypass line to modulate the flow to the compressor. Claim 3 of the instant reissue application is directed to a system having a compressor and comprising a solenoid valve in a suction line, a means for rapidly pulsing the solenoid valve in the suction line, a fluid path extending from a condenser to an expansion device to the compressor, an economizer circuit connected to the fluid path, a solenoid valve in the economizer circuit, and a means for rapidly pulsing the solenoid valve in the economizer circuit to modulate the flow to the compressor.

There is no teaching, suggestion, or disclosure in U.S. Patent No. 6,206,652 to use a bypass line or a valve in a bypass line. Additionally, U.S. Patent No. 6,206,652 fails to disclose, teach or suggest use of an economizer circuit and a valve in the economizer circuit. Accordingly, applicant submits that claims 1-3 of the instant reissue application do not correspond to proposed Count I or II, and claims 1-3 of the instant reissue application are not patentable over the subject matter of the proposed counts and over U.S. Patent No. 6,206,652.

**Claims 16 and 28.** Claims 16 and 28 are patentable over the subject matter of proposed counts I and II. Each of these claims newly presented in the subject reissue application defines an air conditioning or refrigeration system (claim 16) or a capacity modulated compressor (claim 28) comprising, in combination with the other recited elements, a solenoid valve operative in response to capacity control signals received from the controller to cycle between a fully open position and a fully closed position to modulate compressor capacity and in the fully closed position to permit a limited fluid flow through the refrigerant flow line. In the context of the claimed refrigeration system, a solenoid valve which in the "fully closed position" allows a limited fluid flow through a refrigerant flow line is patentably significant. It is neither taught nor suggested by the prior art of record in the '556 Patent. It provides significant operational advantage as discussed in the '556 Patent in the paragraph beginning at line 38 of Column 2 of the '556 Patent.

## IX. Conclusion

Applicant submits that an interference should be declared between the instant reissue application and United States Patent No. 6,206,652.

Applicant respectfully requests declaration of an interference between the instant reissue application and United States Patent No. 6,206,652.

Respectfully submitted,  
Lifson, A.

Date: 30 July 2001

By:   
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### CERTIFICATE OF MAILING

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